IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :

Hiroyuki TOKUNAGA et al. : **Attn: BOX PCT**

Serial No. NEW : **Docket No. 2001-1339A**

Filed September 25, 2001 :

MEASURING APPARATUS USING BIOSENSOR, BIOSENSOR USED THEREFOR, AND EXCLUSIVE STANDARD SOLUTION
[Corresponding to PCT/JP01/00471
Filed January 25, 2001]

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents,
Washington, DC 20231

Sir:

Prior to examination of the above-referenced U.S. patent application please amend the application as follows:

IN THE SPECIFICATION

Please amend the specification as follows:

Please replace the paragraph beginning at page 12, line 16, to page 13, line 1, with the following rewritten paragraph:

On the other hand, in contrast with the sensor, as a measuring device, one which is shown in figure 2 is employed. When a sensor 13 is mounted, the power to a measuring device 14 is turned on, and the measuring device is in a stand-by condition where a voltage of 0.5V is applied between the working electrode 1 and the third electrode 3 or between the counter 2 and the third electrode 3. This applied voltage values are different in accordance with the materials of the third electrode 3.

Please replace the paragraph beginning at page 18, line 22, to page 19, line 6, with the following rewritten paragraph:

The present invention provides a measuring apparatus which can automatically judge types of sample solution without artificial preoperation, a sensor used therefor, and an exclusive standard solution, comprises a third electrode besides a working electrode and a counter electrode, and judges types of sample solution by utilizing the fact that an oxidation current value obtained from the third electrode when the exclusive standard solution is a sample is significantly different from the oxidation current value obtained from the third electrode when blood is a sample.

REMARKS

The above amendments have been made to make minor editorial changes so as to generally improve the form of the specification.

Attached hereto is a marked-up version of the changes made to the specification by the current Preliminary Amendment. The attached page is captioned "**Version With Markings to Show Changes Made**".

Respectfully submitted,

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Version with Markings to Show Changes Made

3 is arranged in a position where the third electrode 3 comes in contact with the measurement sample, it may be arranged in any position.

Further, the third electrode 3 consists of easily oxidized materials as compared with the working electrode 1 and the counter electrode 2, and, for example, silver, copper, zinc, or mixed materials including them correspond to the easily oxidized materials. In this embodiment, a silver electrode is employed as the third electrode 3.

When the sensor so constructed comes in contact with the opening 9 of the sample supplying groove 10, a fixed quantity (here, as approximately 3μL) of the sample is introduced into the reaction layer 12 and the respective electrode parts 1, 2 and 3 by capillary action, whereby suction of the samples reaches the third electrode 3 and then stops.

On the other hand, in contrast with the sensor, as a measuring device, one which is shown in figure 2 is employed. When a sensor 13 is mounted, the power to a measuring device 14 is turned on, and the measuring device is in a stand-by condition where a voltage of 0.5V is applied between the working electrode 1 and the third electrode 3 or between the counter 2 and the third electrode 3. This [a]pplied voltage is a voltage which is lower than that of dissolution potential of materials used for the third electrode 3, and] applied voltage values [thereof] are different in accordance with the materials of the

third electrode 3.

When a sample is introduced into the sensor 13 during the stand-by condition of the measuring device 14, a fixed quantity (here, as approximately 3μL) of the sample is introduced into the reaction layer 12 and the respective electrode parts by capillary action via the sample supplying groove 10. Thereafter, when oxidation current which is measured in the third electrode 3 is the fixed quantity (here, as 0.3μA/0.5 second) or more, an application of the voltage to the sensor 13 is once stopped, and the reaction proceeds for a predetermined time.

After the predetermined time has elapsed, the voltage is applied again, and the current value corresponding to glucose level is measured. The measurement of the current value corresponding to this glucose level is made, specifically, by applying a voltage of 0.5V between the working electrode 1 and the counter electrode 2 or among the working electrode 1, the counter electrode 2, and the third electrode 3, and measuring the current value obtained in the working electrode 1 at that time.

Next, the exclusive standard solution used for the measuring device 14 using the glucose sensor according to the present invention will be described.

The exclusive standard solution is characterized by further merging a substance which suppresses oxidation current

automatically judging whether the type of sample solution is the standard solution sample or the blood sample. Further, if the foregoing is previously programmed in the measuring device 14, when the current value corresponding to glucose level after applying the voltage again is displayed and stored, the whole blood sample and the standard solution sample can be full-automatically discriminated between to be displayed and stored.

Further, while the glucose sensor is taken as an example in this embodiment, the similar effect can be obtained as long as a measuring device for a simple type electrode biosensor, a sensor, and a standard solution are used for cholesterol, lactic acid or the like.

In addition, while one in which the judgment of the types of sample solution is made by comparing the oxidation current value obtained from the third electrode 3 to the predetermined threshold value is described in this embodiment, the judgment of the types of sample solution may be made on the basis of a difference between the time variations of the oxidation current values obtained from the third electrode 3.

Industrial Availability

The present invention provides a measuring apparatus which can automatically judge types of sample solution without artificial preoperation, a sensor used therefor, and an exclusive standard solution, comprises a third electrode

besides a working electrode and a counter electrode, and judges types of sample solution by utilizing the fact that an oxidation current value obtained from the third electrode when the exclusive standard solution is a sample is significantly different from the oxidation current value obtained from the third electrode when blood is a sample.